Space Weather Forecast

Issued on Tuesday, 17 October 2023 at 13:28 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Slight Chance of G1/Minor Storm intervals throughout due to transitory faster winds and potential CME glancing blows.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Low, with occasional Common class flares. Peak flare was from a new sunspot region rotating onto the northeast limb. The largest regions are both relatively mature spots near centre disc, and showed very little development. The other regions are all smaller and simple. An energetic (long lasting) common class flare occurred from a sunspot in the northeast which then decayed. This flare produced a CME (coronal mass ejection), with analysis still ongoing. However preliminary assessment suggests this either missing or with a slight glance possible late day 3 or early day 4 (19-20 Oct). A further CME was observed 17/0500 UTC associated with a small flare in the southwest disk, we await imagery for analysis.

Solar Wind / Geomagnetic Activity: Solar winds were indicative of background slow wind. The speed of the wind eased from 350 km/s to around 300 km/s. Interplanetary magnetic field (IMF), was weak. The north-south component was also weak, but mainly positive (northward). Geomagnetic activity was Quiet (Kp 0-2).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) remained at background, with no solar radiation storms observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Low activity is expected, with only slight chance of isolated Moderate flares.

Solar Wind / Geomagnetic Activity: There are three CMEs with potential Earth-directed components. Two from the 14th which, given similar speeds and source longitude and one shortly following the other, have the potential to follow each other closely, or more likely occur as a single glance. This is currently forecast for early day 2 (18 Oct). A further CME which was observed on the 16 Oct in the northeast, preliminary analysis suggests a glancing impact possible late of day 3 (19 Oct) or early on day 4 (20 Oct).

Some transitory influence possible from faster solar wind, but otherwise solar winds expected to be near background. Mainly Quiet geomagnetic activity expected, but occasional Unsettled to Active intervals likely, with a slight chance G1 Minor Storm intervals throughout the period from potential transitory wind enhancements and CME glances. All low confidence.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is forecast to persist at background, with no solar radiation storms occurring.

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Met Office Space Weather Forecast

Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	20	20	10	20
Strong	G3	No	1	1	1	5
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	20	25	30	35
Very Active	R3 to R5 X	No	1	1	1	1

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	1	1	1	1
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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